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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,363	11/15/2001	Yukiko Kubota	010952	4664

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EXAMINER
BERNATZ, KEVIN M

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/003,363	KUBOTA ET AL.	
	Examiner	Art Unit	
	Kevin M Bernatz	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12-21,25,27 and 29-44* is/are pending in the application.

4a) Of the above claim(s) *27 and 31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12-21,25,29,30 and 32-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-10,12-21,25,27 and 29-44* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☒ Interview Summary (PTO-413) Paper No(s). *6* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Amendments to the specification and claims 1 – 9, 11, and 14 - 44, filed on May 27, 2003, have been entered in the above-identified application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

3. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1 – 10, 12, 13, 29, 30 and 32 - 44, drawn to a magnetic recording medium, classified in class 428, subclass 694TS; and
Claims 14 – 21 and 25, drawn to a nominal method of making a magnetic recording medium, classified in class 428, subclass 694TS.

II. Claims 27 and 31, drawn to a method of making a magnetic recording medium using flash annealing, classified in class 427, subclass 532+.

4. The Examiner notes that claims 1 – 10, 12, 13, 29, 30 and 32 - 44 are not distinct from claims 14 – 21 and 25 since there is no undo burden to the Examiner to examine the nominal method claims in addition to the product claims.

5. However, inventions I and III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product

or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process, such as though sputtering without any post deposition annealing.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

7. Therefore, newly submitted claims 27 and 31 are directed to an invention that is independent or distinct from the invention originally claimed for the reasons cited above.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 27 and 31 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 14, 19, 20, 25, 34 – 36, 42 and 43 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 6,531,202 B1 (Litvinov et al.) in view of Howard et al. (U.S. Patent No. 4,632,883).

Regarding claims 14 and 34 – 36, Litvinov et al. claims a perpendicular magnetic recording disk comprising a substrate and a soft magnetic underlayer on the substrate, wherein said soft magnetic underlayer exhibits magnetic anisotropy in a radial direction, i.e. "in a plane parallel to the surface of said recording" (claims 1 and 2).

Litvinov et al. fail to claim a non-magnetic spacer material on the substrate under the soft magnetic layer.

However, Howard et al. teach that it is known in the art to use non-magnetic spacer materials between the substrate and soft magnetic layers inorder to improve the

adhesion of the soft magnetic layer to the substrate (*col. 3, line 62 bridging col. 4, line10*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Litvinov et al. to use a non-magnetic space layer meeting applicants' claimed limitations as taught by Howard et al., since such a spacer layer would serve to improve the adhesion of the soft magnetic layer to the substrate.

It has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established and the burden of proof is shifted to applicant to show that prior art products do not necessarily or inherently possess characteristics of claimed products where the rejection is based on inherency under 35 USC 102 or on *prima facie* obviousness under 35 USC 103, jointly or alternatively. Therefore, the *prime facie* case can be rebutted by ***evidence*** showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

In the instant case, the claimed structure of Litvinov et al. is deemed to inherently result in a soft magnetic layer acting as a "single magnetic domain". The sound basis

for this belief is that Litvinov et al. admits that the disclosed invention results in a soft magnetic layer "is brought into a substantially single-domain state by the magnetic field" (*col. 1, lines 52 – 54*).

Therefore, in addition to the above disclosed limitations, the presently claimed property of "said soft magnetic underlayer acts as a single domain" would have inherently been present because Litvinov et al. admits that the disclosed invention results in a soft magnetic layer being in a single domain state.

Regarding claims 19, Howard et al. disclose Ta as the preferred adhesion layer (*claim 6*).

Regarding claim 20, neither Litvinov et al. nor Howard disclose thickness values for the Ta adhesion layer. However, the thickness of the adhesion layer is deemed a results effective variable in terms of the bonding characteristics and production costs, since too thin of an adhesion layer will result in poor bonding and too thick of a layer will unnecessarily raise the production costs by using an excessive amount of Ta. Therefore, the Examiner deems that it would have been obvious to one having ordinary skill in the art to determine a thickness value of the adhesion layer meeting applicants' claimed limitations by optimizing the results effective variable through routine experimentation. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 25 and 42, Howard et al. further teach that a non-magnetic Ta layer deposited between the soft magnetic underlayer and the perpendicular magnetic layer will improve the perpendicular coercivity (*col. 2, line 61 bridging col. 3, line 2*).

Regarding claim 43, the presently claimed property of "the hard axis of said soft magnetic underlayer is perpendicular to said radial direction" would have inherently been present because Litvinov et al. admits that the easy axis of magnetization is in the radial direction (*col. 3, lines 49 – 50*) and it is known in the art that the easy and hard axis of magnetizations are roughly perpendicular to each other.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 29, 30 and 44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In the instant case, no mention of the type of coupling between adjacent soft magnetic underlayers is noted in the specification (claims 29 and 30) and applicants only disclose "an anisotropy field of 40 – 50 Oersteds (Oe) or higher", not a "saturation field in the direction of said hard axis of said soft magnetic underlayer is greater than or equal to about 40 Oe" (claim 44).

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (f) he did not himself invent the subject matter sought to be patented.

13. Claims 14, 34 – 36 and 43 rejected under 35 U.S.C. 102(e) as being anticipated by Litvinov et al. ('202 B1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

and

14. Claims 14, 34 – 36 and 43 are rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter.

Regarding claims 14 and 34 – 36, Litvinov et al. disclose a perpendicular magnetic recording disk comprising a substrate (*col. 2, lines 38 – 42 – e.g. "AlMg"*), a non-magnetic spacer layer (*col. 2, line 42 – e.g. "NiP"*), and a soft magnetic underlayer on the substrate, wherein said soft magnetic underlayer acts as a single magnetic domain (*col. 1, lines 52 – 54*) exhibiting magnetic anisotropy in a radial direction, i.e. "in a plane parallel to the surface of said recording" (*col. 3, lines 28 – 32*).

Regarding claim 43, the presently claimed property of "the hard axis of said soft magnetic underlayer is perpendicular to said radial direction" would have inherently been present because Litvinov et al. admits that the easy axis of magnetization is in the radial direction (*col. 3, lines 49 – 50*) and it is known in the art that the easy and hard axis of magnetizations are roughly perpendicular to each other.

Claim Rejections - 35 USC § 103

15. Claims 19, 20, 25 and 42 are directed to an invention not patentably distinct from claims 1 and 2 of commonly assigned patent '202 B1 (Litvinov et al.). Specifically, it is known in the art to include non-magnetic layers meeting applicants' claimed limitations below and above soft magnetic layers in perpendicular recording disks (e.g. see Paragraph 9, above).

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP § 2302). Commonly assigned application and patent, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly

assigned case qualifies as prior art under 35 U.S.C. 102(f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee is required under 35 U.S.C. 103(c) and 37 CFR 1.78(c) to either show that the conflicting inventions were commonly owned at the time the invention in this application was made or to name the prior inventor of the conflicting subject matter. Failure to comply with this requirement will result in a holding of abandonment of the application.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications filed on or after November 29, 1999.

16. Claims 19, 20, 25 and 42 are rejected under 35 U.S.C. 103(a) as being obvious over Litvinov et al. as applied above, and further in view of Howard et al. ('883).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR

1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Litvinov et al. is relied upon as described above.

Regarding claim 19, Litvinov et al. fail to claim a non-magnetic spacer material on the substrate under the soft magnetic layer meeting applicants' claimed composition limitation.

However, Howard et al. teach that it is known in the art to use non-magnetic spacer materials between the substrate and soft magnetic layers inorder to improve the adhesion of the soft magnetic layer to the substrate (*col. 3, line 62 bridging col. 4, line10*). Howard et al. further teach that the preferred material is Ta (*claim 6*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Litvinov et al. to use a non-magnetic space layer meeting applicants' claimed limitations as taught by Howard et al., since such a spacer layer would serve to improve the adhesion of the soft magnetic layer to the substrate.

Regarding claim 20, neither Litvinov et al. nor Howard disclose thickness values for the Ta adhesion layer. However, the thickness of the adhesion layer is deemed a results effective variable in terms of the bonding characteristics and production costs, since too thin of an adhesion layer will result in poor bonding and too thick of a layer will unnecessarily raise the production costs by using an excessive amount of Ta. Therefore, the Examiner deems that it would have been obvious to one having ordinary skill in the art to determine a thickness value of the adhesion layer meeting applicants' claimed limitations by optimizing the results effective variable through routine experimentation.

Regarding claims 25 and 42, Howard et al. further teach that a non-magnetic Ta layer deposited between the soft magnetic underlayer and the perpendicular magnetic layer will improve the perpendicular coercivity (*col. 2, line 61 bridging col. 3, line 2*).

17. Claims 14, 25, 34 – 37, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugita et al. ('712) in view of Ando (U.S. Patent No. 6,395,413 B1) and Hikosaka et al. (U.S. Patent No. 5,942,342).

Regarding claims 14 and 34 - 36, Sugita et al. disclose a perpendicular magnetic recording medium comprising a substrate (*Figure 10, element 12*), a non-magnetic spacer layer on the substrate (*element 17*), and a soft magnetic underlayer on the substrate (*element 13*).

Sugita et al. fail to disclose the medium being in the shape of a disk (claims 34 – 36).

However, the Examiner deems that magnetic tapes and magnetic disks are known equivalents in the field of perpendicular magnetic media, as evidenced by Ando (*col. 3, lines 11 – 13*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, magnetic recording disks and magnetic recording tapes are equivalents in the field of magnetic recording media. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Sugita et al. fail to disclose said soft magnetic underlayer acting as a single magnetic domain exhibiting magnetic anisotropy in a plane parallel to the surface of said recording material.

However, both Ando and Hikosaka et al. teach that it is known in the art to eliminate domain walls in soft magnetic underlayers to prevent Barkhausen noise (*Hikosaka et al., col. 3, lines 31 – 49 and col. 3, line 65 bridging col. 4, line 3; Ando, col. 4, lines 4 - 10*). Hikosaka et al. further teach that a biasing film applied such that exchange coupling is exerted between it and the soft magnetic film(s) results in the soft magnetic material acting as a single magnetic domain (*Hikosaka et al., col. 9, lines 18 – 36*) and that such a bias magnetic field is in the in-plane direction parallel to the surface of the recording medium, i.e. "in the radial direction of the medium" (*col. 9, lines 31 – 36*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Sugita et al. to utilize a soft magnetic

layer acting as a single magnetic domain as taught by Ando and Hikosaka et al. inorder to prevent Barkhausen noise.

In addition to the above disclosed limitations, the presently claimed property of "exhibiting magnetic anisotropy in a plane parallel to the surface of said recording material" would have necessarily been present because Hikosaka et al. teaches that the biasing field effecting the soft magnetic layer is in a plane parallel to the surface of said recording material.

Regarding claims 25 and 42, Sugita et al. disclose second non-magnetic spacer layers meeting applicants' claimed structural limitations (*Figure 9, layer 16*).

Regarding claim 37, Sugita et al. disclose multilayered soft magnetic underlayers (*Figure 10, layers 14 and 15*).

Regarding claim 43, the presently claimed property of "the hard axis of said soft magnetic underlayer is perpendicular to said radial direction" would have necessarily been present because it is known in the art that the easy and hard axis of magnetizations are roughly perpendicular to each other, and the Examiner has provided sound basis for the belief that the easy axis, i.e. the magnetic anisotropy, will be in the radial direction.

18. Claims 1 – 3, 9, 10, 32, 38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugita et al. in view of Ando and Hikosaka et al. as applied above, and further in view of Ikeda et al. (U.S. Patent No. 6,468,670 B1).

Sugita et al. in view of Ando and Hikosaka et al. is relied upon as described above.

Regarding claims 1, 9, 10, 32, 38 and 40, none of the above disclose using a CoFeB based soft magnetic underlayer.

However, the Examiner deems that NiFe and CoFeB are known equivalents in the field of soft magnetic layers for perpendicular media, as evidenced by Ikeda et al. (*col. 3, lines 25 – 48*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, NiFe and CoFeB are equivalents in the field of soft magnetic layer materials for perpendicular recording media.

Regarding claims 2 and 3, Sugita et al. teach that the thickness of the non-magnetic spacer layers and the soft magnetic underlayers can be varied to effect the recording and reproducing characteristics in a perpendicular magnetic recording medium (*Figures 4 and 5; col. 2, lines 29 – 64; col. 3, lines 1 – 35; col. 4, lines 36 – 41; and Examples*). Therefore, the Examiner deems that it would have been obvious to one having ordinary skill in the art to optimize the thickness of the non-magnetic spacer layers and soft magnetic underlayers, thereby meeting applicants' claimed limitations by optimizing the results effective variable through routine experimentation.

19. Claims 4 – 6, 12, 13, 19, 20, 29, 30, 33 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugita et al. in view of Ando, Hikosaka et al. and Ikeda et al. as applied above, and further in view of Howard et al. ('883).

Sugita et al. in view of Ando, Hikosaka et al. and Ikeda et al. is relied upon as described above.

Regarding claims 4, 13, 19, and 41, none of the above teach using Ta non-magnetic spacer layers.

However, the Examiner deems that Ti and Ta are known equivalents in the field of non-magnetic spacer materials used above and below soft magnetic layers, as evidenced by Howard et al. (*col. 1, lines 41 – 44; col. 2, lines 6 – 12; and col. 3, line 63 bridging col. 4, line 10*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, Ti and Ta are equivalents in the field of non-magnetic spacer layer materials, wherein Ta is a preferred embodiment since it further results in improved perpendicular coercivity of the perpendicular magnetic layer (*col. 2, line 61 bridging col. 3, line 2*).

Regarding claims 5, 6, 12 and 20, Sugita et al. teach that the soft magnetic underlayer thickness and the spacer layer thickness values are results effective variables as described above, and further teaches that each layer need not be identical in thickness (*Table and col. 4, lines 36 – 41*).

Regarding claims 29, 30 and 33, in addition to the above disclosed limitations, the presently claimed property of "are ferromagnetically coupled" would have

necessarily been present because it is known in the art that extremely thin non-magnetic spacer layers result in antiferromagnetic coupling and extremely thick non-magnetic spacer layers completely decouple adjacent magnetic layers. Since the layers disclosed by Sugita et al. are of an intermediate thickness >10 Å and < 500 Å, the Examiner has sound basis for believing that the soft magnetic underlayers are ferromagnetically coupled.

20. Claims 7, 8, 15 – 18, 21 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugita et al. in view of Ando, Hikosaka et al. and Ikeda et al. as applied above, and further in view of Fujimura et al. ('308), Platt et al. (IEEE, 2001), Beatrice et al. (IEEE, 1997), Kraus et al. (IEEE, 1994) and Brouha et al. ('324 A1).

Sugita et al. in view of Ando, Hikosaka et al. and Ikeda et al. is relied upon as described above.

Fujimura et al., Platt et al., Beatrice et al., Kraus et al. and Brouha et al. all teach that the amount of Co, Fe and B in a CoFeB soft magnetic alloy can be varied to effect the soft magnetic properties (*see Paragraph 16 of the Office Action mailed February 2, 2003 – Paper No. 3*). Therefore, the Examiner deems that it would have been obvious to one having ordinary skill in the art to determine an amount of Co, Fe and B meeting applicants' claimed concentration limitations by optimizing the results effective variable through routine experimentation.

21. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugita et al. in view of Ando and Hikosaka et al. as applied above, and further in view of web document titled "Chapter 1: Introduction".

Sugita et al. in view of Ando and Hikosaka et al. is relied upon as described above.

None of the above disclose "the saturation field in the direction of said hard axis of said soft magnetic underlayer is greater than or equal to about 40 Oe".

Regarding claim 44, the web document titled "Chapter 1: Introduction" teaches the importance of maximizing the saturation field inorder to allow soft magnetic materials to be used in a wider range of applications (*Page 12*). The Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the saturation field through routine experimentation, especially given the teaching in the art regarding the desire to maximize the value to allow for a wider range of applications for the soft magnetic materials.

Response to Arguments

22. The rejection of claims 1, 2, 9, 10, 14 and 26 under 35 U.S.C § 102(e) – Shukh et al.

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. a single domain state) no longer anticipated, nor rendered obvious, by the above noted rejection.

23. The rejection of claims 1 – 14, 21 and 26 under 35 U.S.C § 103(a) – Sugita et al.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Specifically, the above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. a single domain state) no longer anticipated, nor rendered obvious, by the above noted rejection.

Conclusion

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Applicants' amendment resulted in embodiments not previously considered (i.e. "single domain state") which necessitated the new grounds of rejection, and hence the finality of this action.

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

KMB
July 8, 2003

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Supervisory Patent Examiner
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